Future Alternative B

Description of Alternative B

Alternative A made an effort to meet the goals of this study, but as mentioned above some persistent drainage problems remain. Alternative B uses some of the same features as Alternative A, but builds from there to make a more thorough effort at satisfying the study goals. Figure 11 gives an overview of the improvements considered to be part of Alternative B. Unlike Alternative A, Alternative B does not utilize additional storage south of Erle Rd. The higher peak flows generated by the development of commercial subshed XIA(S) are mitigated by the various Alternative B improvements north of Erle Rd.

The following infrastructure components make up Alternative B:

Continued features from Alternative A:

- Interception of Olivehurst Drain near Griffith and Linda Avenue. The 60-inch pipe is now in Linda Avenue from the east side of Griffith to the north end of the Orchard Pond. That 60-inch pipe will be extended across private property east from Griffith Avenue for about 270 feet. At the east end, a concrete box structure will be constructed to intercept Olivehurst Drain and drop it into the 60-inch pipe.
- Gravity drain Orchard pond to the Olivehurst Interceptor. This is envisioned as twin 5-foot pipes running along the south side of Erle Road. The distance is 3600 feet. Flap gates would be required at the Interceptor end. The added runoff delivered to Orchard Pond cannot be handled by the current pumps discharging to Olivehurst Drain.

New features added with Alternative B:

- Convert Orchard Pump Station to just one 20 cfs pump. This would be considered a nuisance pump only. The other two current pumps would be removed. This is a significant step towards reducing pumping costs.
- Drain most of the central East Linda Specific Plan Area utilizing linear detention. A similar idea for • a channel designated the "Eastside Interceptor" in various alignments has been considered as far back as the 1992 SYDMP. In this study, the linear detention is envisioned to be 8800 feet long extending from just north of the current Orchard pond to the east around the large open parcel north, back west at North Beale Road, crossing under N. Beale Road next to the Goldfields Parkway and continuing northward up to the south side of Hammonton-Smartsville Road west of the Jehovah's Witness Church, starting again just north of Hammonton-Smartsville and ending 1400 feet north of there. The excavation is estimated to be about 245,000 cubic yards. The depth of the excavation will average slightly more than 10 feet. The bottom width is about 45 feet. The top width is about 130 feet including a 15-foot road on both sides. It would require about 27 acres of land. The dirt would probably be used for the continued construction of Goldfields Parkway (especially as it is raised to pass over the Yuba River levee), filling in nuisance detention ponds to minimize ongoing maintenance, or for other construction projects in the area. This channel will receive runoff directly from developed subsheds SP5, SP8, SP9, SP15, and SP16. It is also envisioned to receive 70% of the runoff from SP1 and SP2 on the north side of Hammonton-Smartsville Road. Under Alternative B, 30% of the runoff from those two north subsheds would continue to drain to Linda Drain.

- The road crossings for the linear detention. Restrictive culverts would be used in three spots to more fully utilize the storage capacity of the linear detention. The locations are: at south end at or near Linda Avenue, under N. Beale Road and under Hammonton-Smartsville Road. Each would be either a 4-foot or 3.5-foot diameter culvert placed at the bottom of the channel.
- Connection structures to Linda Drain. At the point where Linda Drain and the linear detention channel cross, there will be a connection utilizing an energy dissipating structure that will drop the Linda Drain flow from both directions into the linear detention. From the west side, it would likely require a 5 or 6 foot culvert passing under Goldfields Parkway. That would probably be 200-feet long. From the east, a concrete chute is envisioned with RSP near the bottom.
- Improve or remove seven culvert crossings on Linda Drain. All are small driveway or farm crossings. The crossings included are:
 - Butler Property at Station 279+45. Remove existing culvert and crossing; put in a railcar.
 - Driveway across from Alberta Avenue at Station 304+54. Replace existing culverts with double 42-inch diameter.
 - o Driveway at Station 307+11. Replace existing culvert with a 5-foot diameter.
 - Driveway at Station 312+50. This one should be automatically eliminated by the construction of the Goldfields Parkway.
 - Farm crossing at Station 326+03. Add second 4-foot diameter culvert.
 - o Driveway at Station 331+41. Replace existing culvert with 6-foot diameter.
 - Farm crossing at Station 340+53. Remove 2 small existing culverts and crossing; put in a railcar.

Hydraulic Model for Alternative B

The features discussed above have been added to the unsteady HEC-RAS model to represent Alternative B. The future condition HEC-1 hydrographs have been introduced at appropriate locations via DSS. Generally under this alternative, as compared with Alternative A, more of the East Linda Specific Plan Area drains to the new linear detention ("Eastside Interceptor") and Orchard Pond and less drains to Linda Drain. Meanwhile, as in Alternative A, the interception of Olivehurst Drain at Linda Avenue greatly reduces flows south of there adjacent to Griffith Avenue. The future Eastside subdivision just east of the Montrose subdivision has much higher peak runoff than the land currently produces, but it is assumed to route underground to the Orchard Pond collector at the south end of Griffith. The Alternative B HEC-RAS model reflects that connection. The HEC-RAS model also contains the large gravity drain from Orchard Pond to the Olivehurst Interceptor. The Alternative B HEC-RAS model changes the Orchard Pond pumping from the current three pumps to just the 20 cfs nuisance pump. The model also includes the structure connecting the new linear detention channel to Linda Drain as well as the improved culverts at seven locations on Linda Drain.

Under existing conditions, the undeveloped shed XIA(S) drains to the Linda Drain/Edgewater Ditch that runs north to south through the property. Once developed, the runoff will be routed underground to convenient locations. Under Alternative B, the runoff is modeled to route 10% to the Edgewater Ditch, 20% to the

Olivehurst Interceptor on the east and 70% to the junction point just south of XIA(S) where the Edgewater Ditch (Linda Drain) meets the Olivehurst Interceptor.

The same modeling assumptions discussed earlier apply to this future conditions Alternative B hydraulic model.







Predicted Peak Water Surface Elevations and Flows for Alternative B

Some of the 100-year and 10-year calculated water elevations and flow rates for future conditions under Alternative B are shown in Table 7. More complete results may be found in Appendix E, including the profile data for stage versus location for different storm events.

Table 7
Future Alternative B HEC-RAS Indications of Peak WSELs and Flows at Various
Locations in the South Yuba Drainage Master Plan Area.

	10-year Storm		100-year Storm	
Location	Computed Peak WSEL, (feet NGVD 29)	Peak Flow, cfs	Computed Peak WSEL, (feet NGVD 29)	Peak Flow, cfs
Olivehurst Interceptor at Reeds Creek, Sta 6+71	57.10	238	60.00	405
Olivehurst Interceptor below pond, Sta 108+60	59.86	248	61.67	432
Olivehurst Interceptor Pond	60.68	n/a	61.90	n/a
Edgewater Ditch at Erle Road, Sta 277+66	61.31	82	62.55	128
Edgewater Pond	61.42	n/a	62.43	n/a
Olivehurst Interceptor at Erle Road, Sta 200+00	62.11	299	63.18	412
Linda Drain at N. Beale Road, Sta 253+98	66.00	134	66.49	162
Linda Drain near Alberta Avenue, Sta 304+34	67.01	2	67.54	8
Linda Drain at upstream side of Griffith Avenue, Sta 326+48	67.90	28	68.35	44
Sierra Vista Pond	67.93	n/a	68.47	n/a
Linda Drain at east border of East Linda Specific Plan, Sta 340+95	69.03	25	69.63	42
Linda Drain at Brophy Road, Sta 455+27	78.31	33	79.53	58
Olivehurst Drain at junction with Interceptor, Sta 20+00	60.69	30	61.91	37
Olivehurst Drain south of Erle Road pond outfall, Sta 106+54	63.96	21	64.25	21

Orchard Pond	61.82	n/a	64.17	n/a
Olivehurst Drain south Griffith Road at pond inlet structure, Sta 149+25	64.54	50	65.26	75
Olivehurst Drain at Linda Avenue, Sta 169+33	67.04	2	67.46	3
Olivehurst Drain at N. Beale Road, Sta 195+43	69.83	25	70.02	36
Olivehurst Drain west of Wood Ln., Sta 206+02	70.52	5	70.89	10

Flood Maps for Alternative B

The future conditions 100-year water surface elevations have been used with the topographic information to produce a modified flood map for the study area representing the Alternative B infrastructure and the increased runoff associated with development in the East Linda Specific Plan and the General Plan area XIA(S). The map is shown in Figure 12. The changes to the map are more widespread than those with Alternative A. Linda Drain in the Griffith area and downstream is affected considerably by the collection into the linear detention channel and by the improved culverts on Linda Drain. As in Alternative A, the upper part of Olivehurst Drain in the vicinity of North Beale Road received no improvement from Alternative B. Since runoff from farther north is redirected into the linear detention channel ("Eastside Interceptor") and Orchard Pond, that pond is more fully utilized than under current conditions. The map shows the 100-year water surface boundaries in the entire region under study.

The main accomplishment of the Alternative B infrastructure is to successfully accommodate the increased peak runoff from development within the East Linda Specific plan and the General Plan area XIA(S). In addition, flooding simulations in some areas under this alternative show significant improvement over current conditions. In particular:

- The flooding in Upper Olivehurst Drain along the south end of Griffith Avenue below Linda Avenue is eliminated.
- The flooding on the south side of Yuba College from Butler Ditch is eliminated.
- The flooding on Linda Drain from the east side of the East Linda Specific Plan Area down to the west portion of the Butler Property is all but eliminated.
- Although south of the focus area of this study, the Olivehurst Drain below Erle Road conveys far less flow under this alternative and shows no flooding outside the channel.

From a comparison of Table 4 with Table 7 it is evident that peak flows delivered southward from the SYDMP area to Reeds Creek are held to current conditions level for the 10-year storm and held below current conditions for the 100-year storm. Furthermore, Alternative B produces significantly lower 100-year outflow numbers than Alternative A.





Persistent Storm Drainage Problem Areas for Alternative B

Linda Drain Flooding North of Yuba College

This is the grassy area shown in Photograph 3, historically known as the Butler Property. Shallow flooding in the area has been indicated by all flood maps dating back at least to the 1981 FIS. While Alternative B is predicted to greatly improve the situation, the flooding remains in the low western portions of the property. This remaining flooded area can be seen in Figure 12. Any development project in this western area would need to include grading or other methods designed to alleviate the problems. Alternative C will include a local solution to this area.

Olivehurst Drain Flooding above Linda Avenue

According to the HEC-RAS simulation, the interception of Olivehurst Drain at Linda Avenue improves the situation from that point southward to Erle Road. The modeling assumes that the "Eastside" development will drain to the existing catch facility on the east side of Griffith just north of Erle Road. However, north of Linda Avenue to Wood Lane there is little relief. Conveyance in that area is limited by the poor capacity of the Olivehurst Drain ditch. The flooded areas indicated in Figure 12 adjacent to upper Olivehurst Drain are very similar to those under current conditions. Because of presumed Specific Plan development north of North Beale Road, the peak flows in upper Olivehurst Drain are modeled to be slightly higher than current. The flooding impacts a number of residential/ranch properties. Alternative C will address this area.

Goal of Minimizing the County Costs with Pump Stations, Ditches and Distributed Small Detention Facilities

Under this Alternative B, much of the north part of the East Linda Specific Plan Area will have drainage access to the new linear detention facility. Because of this, the existing Dantoni Pond and its pump can be eliminated and drainage for the Dantoni area can be routed underground to the linear detention facility to the east. Under this Alternative B, Sierra Vista Pond is not eliminated. Likewise, the volume of Orchard Pond combined with the linear detention is not sufficient to completely eliminate the pumping at Orchard Pond. The added runoff collected from an expanded portion of the East Linda Specific Plan Area, even with the gravity drains to the Olivehurst Interceptor, still required a minimal amount of pumping. However, the pumping costs at Orchard Pond are reduced greatly in moving from three main pumps to just one nuisance pump. The revised HEC-1 and HEC-RAS models for the East Linda Specific Plan Area do not utilize most of the small distributed ponds in the area such as the Grove Avenue pond and the College View Estates pond. Unless there is a compelling local engineering reason for such ponds, they could be eliminated without impacting the results of this drainage master plan. Small ponds that are maintained by the County should have the highest priority for elimination. Those include the Dantoni Pond and the College View Estates Pond. Fill material for the elimination of nuisance detention ponds will be readily available from the excavation of the linear detention channel. Detention facilities that cannot be eliminated under this Alternative B are: Sierra Vista Pond, Edgewater Pond, Orchard Pond, and the Olivehurst Interceptor Pond.